REMARKS

The Office Action dated April 17, 2008 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

In accordance with the foregoing, claims 2, 3, and 15 have been amended to more particularly point out and distinctly claim the subject matter of the invention. No new matter is being presented, and approval and entry are respectfully requested. As will be discussed below, it is also requested that all of claims 1-3, 5, 7, and 11-18 be found allowable as reciting patentable subject matter.

Claims 1-3, 5, 7, and 11-18 are pending and under consideration.

IN THE DRAWINGS:

Please add the attached New Sheet containing Fig. 5. In the New Sheet of FIG. 5, includes a description of the features recited in original claims 15 and 18, as filed. No new matter has been added.

The Examiner's approval of the attached New Sheet is respectfully requested.

REJECTION UNDER 35 U.S.C. § 112:

In the Office Action, at page 4, claims 15-18 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. According to the Office Action, the claims contain subject matter which was not described in the

specification in such a way as to enable one skilled in the art to which it pertains to make and/or use the invention.

The arguments submitted in the Response filed on January 10, 2008 are incorporated herein. Furthermore, MPEP 2163.06 provides that information contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter. Therefore, since the original claims included the "means-plus-function" elements and the combination of the specification and claims would enable a person of ordinary skill in the art to make and use the present invention, Applicants respectfully assert that the rejection presented in the Office Action is improper because claims 15-18 are being rejected under 35 USC § 112, first paragraph, rather than the Specification, and therefore it should be withdrawn.

REJECTION UNDER 35 U.S.C. § 103:

Claims 1-3, 5, 7, and 11-18 were rejected under 35 U.S.C. 103(e) as being unpatentable over Applicant's Admitted Prior Art on pages 1-3 of the specification ("AAPA") in view of U.S. Patent No. 6,266,705 to Ullum et al. ("Ullum"). The Office Action took the position that APPA and Ullum describe all the recitations of claims 1-18. It is respectfully asserted that, for at least the reasons provided herein below, AAPA and Ullum fail to teach or suggest the recitations of the pending claims. Reconsideration is requested.

Independent claim 11, upon which claims 12-14 are dependent, recites a method for forwarding an incoming frame in a network switch including, upon receiving an incoming frame, converting a MAC destination address and less significant bits of a VLAN identifier (VID) from the incoming frame into a 12 bit address resolution table (ARL) address which is used to access an address resolution table, and comparing an ARL VID and a MAC address from the address resolution table with the MAC destination address and less significant bits of the VID from the incoming frame to determine if there is an ARL hit. If there is an ARL hit, the method uses an action code from the address resolution table to determine at least one egress port to which the incoming frame is sent and uses the less significant bits of the VID of the incoming frame to access an appropriate entry in a VLAN table. The method also compares a VLAN VID from the VLAN table with more significant bits of the VID of the incoming frame, wherein if the VLAN VID is the same as the more significant bits of the VID of the incoming frame, there is a VLAN match, and forwards the incoming frame to at least one port based on at least one of the ARL hit and the VLAN match. method for forwarding an incoming frame in a network switch including, upon receiving an incoming frame, converting a MAC destination address and less significant bits of a VLAN identifier (VID) from the incoming frame into a 12 bit address resolution table (ARL) address which is used to access an address resolution table, and comparing an ARL VID and a MAC address from the address resolution table with the MAC destination address and less significant bits of the VID from the incoming frame to determine if there is an ARL

hit. If there is an ARL hit, the method uses an action code from the address resolution table to determine at least one egress port to which the incoming frame is sent and uses the less significant bits of the VID of the incoming frame to access an appropriate entry in a VLAN table. The method also compares a VLAN VID from the VLAN table with more significant bits of the VID of the incoming frame, wherein if the VLAN VID is the same as the more significant bits of the VID of the incoming frame, there is a VLAN match, and forwards the incoming frame to at least one port based on at least one of the ARL hit and the VLAN match.

Independent claim 15, upon which claims 1-3, 5, 7, and 16-18 are dependent, recites an apparatus for forwarding an incoming frame in a network switch including converting means for converting a MAC destination address and less significant bits of a VLAN identifier (VID) from an incoming frame into a 12 bit address resolution table (ARL) address which is used to access an address resolution table upon receiving the incoming frame. The apparatus includes comparing means for comparing an ARL VID and a MAC address from the address resolution table with the MAC destination address and less significant bits of the VID from the incoming frame to determine if there is an ARL hit. If there is an ARL hit, the apparatus further includes means for using an action code in the address resolution table to determine at least one egress port to which the incoming frame is sent, and means for using the less significant bits of the VID of the incoming frame to access an entry in a VLAN table. The apparatus also includes comparing means for comparing a VLAN VID from the VLAN table with more

significant bits of the VID of the incoming frame, wherein if the VLAN VID is the same as the more significant bits of the VID of the incoming frame, there is a VLAN match, and forwarding means for forwarding the incoming frame to at least one port based on at least one of the ARL hit and the VLAN match.

As will be discussed below, AAPA and Ullum fails to disclose or suggest the elements of any of the presently pending claims.

AAPA generally describes that upon receiving an incoming frame, the switch obtains the MAC destination address in registers (47:0) and the VID in registers (11:0) from the incoming frame. See paragraph [0004] of the specification of the present application. The incoming frame's MAC destination address in registers (47:0) and the VID in registers (11:0) are hashed to a 12 bit ARL address which is used to access the ARL table. Upon obtaining the appropriate entry in the ARL table, the switch compares the VID in registers (11:0) and MAC address in registers (47:0) in the ARL table with the incoming frame's VID in registers (11:0) and MAC destination address (47:0). If they are the same, then there is an ARL hit and the action code in the ARL table is used to determine which egress port(s) to send the incoming frame to. The incoming frame's VID in registers (11:0) is also used to access the VLAN table and the switch reads the forward map and the un-tag map from the VLAN entry that is associated with the VID. If there was an ARL hit and the ports indicated by the action code in the ARL table are also active in the forward map, then the switch forwards the incoming frame to the identified egress port(s).

Paragraph [0005] of Background of Invention provides that the less significant bits of the VID, i.e., registers (3:0), are used to index the VLAN table and the most significant bits of the VID are predefined among the switch users and fixed. However, as specifically indicated in the Background of the Invention, the drawback of this implementation is that the VID has to be a continuous VLAN space. Therefore, as recited in independent claim 11, and similarly recited in independent claim 15, the method to forward an incoming frame in a network switch has been modified so that "upon receiving an incoming frame, converting a MAC destination address **and less significant bits of a VLAN identifier (VID) from the incoming frame** into a 12 bit address resolution table (ARL) address which is used to access an address resolution table." Contrary to the Office Action's contention that AAPA describes such features, AAPA is silent as to teaching or suggesting the conversion of the MAC destination address and less significant bits of a VLAN identifier (VID) from the incoming frame.

Furthermore, AAPA does not teach or suggest, at least, "comparing an ARL VID and a MAC address from the address resolution table with the MAC destination address **and less significant bits of the VID** from the incoming frame to determine if there is an ARL hit," and "comparing means for comparing a VLAN VID from the VLAN table with **more significant bits** of the VID of the incoming frame, wherein if the VLAN VID is the same as the more significant bits of the VID of the incoming frame, there is a VLAN match; and forwarding means for forwarding the incoming frame to at least one port **based on at least one of the ARL hit and the VLAN match**," as recited in

independent claim 11 and similarly recited in independent claim 15. (Emphasis added) AAPA is devoid of any teaching or suggestion that the ARL VID and a MAC address from the address resolution table with the MAC destination address and less significant bits of the VID from the incoming frame are compared to determine if there is an ARL hit.

Furthermore, the Office Action correctly recognized that AAPA fails to teach or suggest the use of the significant bits and the comparison as recited in independent claims 11 and 15. Accordingly, the Office Action relied on Ullum.

As illustrated in FIG. 3 and described in column 6, lines 44-67, Ullum generally describes that each entry 348 of the data RAM 340 contains a MAC address and VLAN designation pair 350 and an index identifying the port to which the frame is to be sent. A comparison circuit arrangement is provided to verify the forwarding table entry 348 mapped by the hashed MAC address/VLAN pair. A comparator 356 is coupled to the MAC/VLAN pair portion 360 of the outputs of the data RAM 340. The particular MAC/VLAN pair 360' retrieved from the data RAM 340 is compared with the incoming address (MAC/VLAN) 364 of the data frame received from the forwarding engine. If the compared items match, and the corresponding valid bit is set, the associated data (the index value) stored in the data portion 351 of selected entry 348 is retrieved as output 368'.

However, Ullum does not teach or suggest that the comparator 356 compares "an ARL VID and a MAC address from the address resolution table with the MAC

destination address and less significant bits of the VID from the incoming frame to determine if there is an ARL hit," as recited in independent claim 11 and similarly recited in independent claim 15. Rather, Ullum simply generally provides that the MAC/VLAN pair 360' retrieved from the data RAM 340 is compared with the incoming address (MAC/VLAN) 364 of the data frame. Ullum does not specify that the MAC destination address and less significant bits of the VID from the incoming frame are compared with those of the data RAM 340.

Furthermore, Ullum provides that a hash key 458 is used as an address 564 for the data RAM 340 (FIG. 3). See column 7, lines 22-40. As illustrated in FIG. 5 of Ullum, the most significant bits (MSBs), e.g., bits 14, 15 and 16 of hash value 458, are preferably used to identify the VFP to access in RAM 340. Specifically, the MSBs are transposed into the least significant bits (LSBs) of the RAM address 564 and decoded (mod 2) to identify one of physical pages 0 through 7 of the data RAM 340 as the virtual first page associated with the particular MAC address/VLAN pair.

However, rather than providing a comparison of the **VLAN ID from a VLAN table** with **more significant bits of the VID of the incoming frame** to determine whether a VLAN match exists between the VLAN ID and the more significant bits as recited in independent claims 11 and 15, Ullum provides the MSBs of hash value 458 are transposed into the least significant bits (LSBs) of the RAM address 564 to identify one of physical pages 0 through 7 of the data RAM 340 as the virtual first page. Because Ullum does not define "transposing," one can only conclude that the term is to be defined

as well known in the art. By definition, transposing is a change in a relative position, order, or sequence, to interchange; cause to change places; an interchange. However, transposing is not determined to be a comparison of two factors. Therefore, Ullum does not teach or suggest a comparison of the MSBs with the LSBs of the RAM address 564. Furthermore, the result of the transposition of the MSBs with the LSBs of the RAM address 564 in Ullum is to identify one of physical pages 0 through 7 of the data RAM 340 as the virtual first page.

Although Ullum provides that it should be understood that a different set of bits may be selected, Ullum does not describe or suggest whether those set of bits may be the more significant bits of the VID of the incoming frame.

Nothing in Ullum teaches or suggests that if the MSBs **is the same as** the LSBs of the RAM address 564, there is a VLAN match as in the present application. Therefore, Ullum does not cure the deficiencies of AAPA.

Furthermore, Applicants respectfully submit that a combination of AAPA and Ullum fails to teach or suggest, "forwarding the incoming frame to at least one port based on at least one of the ARL hit and the VLAN match," as recited in independent claim 11 and similarly recited in independent claim 15. AAPA fails to teach or suggest features associated with the comparison as recited in independent claims 11 to determine the ARL hit and Ullum fails to teach or suggest that the VLAN match when the VLAN VID is the same as the more significant bits of the VID of the incoming frame. Therefore, a person

of ordinary skill in the art can only conclude that a combination of AAPA and Ullum would fail to teach or suggest the forwarding as recited in independent claims 11 and 15.

In view of the above, it is respectfully submitted that AAPA and Ullum, individually or combined, fail to teach or suggest all the features recited in independent claims 11 and 15 and related dependent claims.

In view of the above, it is respectfully requested that independent claims 11 and 15 and related dependent claims be allowed.

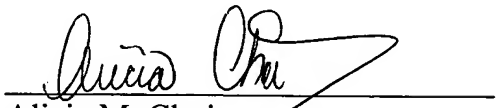
CONCLUSION:

In view of the above, Applicants respectfully submit that the claimed invention recites subject matter which is neither disclosed nor suggested in the cited prior art. Applicants further submit that the subject matter is more than sufficient to render the claimed invention unobvious to a person of skill in the art. Applicants therefore respectfully request that each of claims 1-3, 5, 7, and 11-18 be found allowable and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the Applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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Enclosure: New Sheet FIG. 5